1/2 fw.

IMP. INST. ENT.
— LIBRARY —
15 JAN 1938
SERIAL En. 344 B
SEPARATE

Vol. 7, Part 1. 15th January, 1938.

THE

PROCEEDINGS

OF THE

ROYAL ENTOMOLOGICAL SOCIETY

OF

LONDON

Series B.

TAXONOMY

(being the continuation of Stylops)

LONDON:

PUBLISHED BY THE SOCIETY AND

SOLD AT ITS ROOMS, 41, QUEEN'S GATE, S.W.7

Price 3s. 0d.

NOTICE.

The Proceedings of the Royal Entomological Society of London are issued in three series.

Series A. General Entomology.
Series B. Taxonomy.
Series C. Journal of Meetings.

Series A. and B. are each issued in parts in an annual volume of approximately 240 pages.

Papers submitted for publication in either of these series by authors who are not Fellows of the Society may be accepted if they are communicated by a Fellow. Preference will be given to papers written in the English language, and papers of more than 8 printed pages will not normally be accepted for publication in these journals.

Whilst the Society is prepared to undertake the provision of a reasonable number of text-figures, authors are expected to supply the original drawings for such figures, and in the case of plates, half-tone, or colour-work the author is required to pay for the necessary blocks.

A uniform method is adopted for the citation of bibliographical references in the Society's publications as follows :—

Smith, A., 1936, *Proc. R. ent. Soc. Lond.* (*B*) **6** : 301–306, pl. 1.

——. 1936, *Trans. R. ent. Soc. Lond.* **84** : 901–936.

Titles of periodicals cited are to be abbreviated in the manner indicated in the *World List of Scientific Periodicals*, *2nd edition* 1934.

Authors are entitled to receive 25 copies of their papers free of charge and may purchase additional copies provided that request be made before publication.

Papers offered for publication should be sent to the Secretary, Royal Entomological Society of London, at 41, *Queen's Gate, London, S.W.*7, and must be typewritten on one side of the paper only.

Series C. is issued prior to every General Meeting. It contains abstracts of exhibits to be shown and communications to be made together with the titles of papers accepted for publication.

The annual subscription to *Series A. General Entomology* is £1 4*s.* 0*d.*; *Series B. Taxonomy*, £1 4*s.* 0*d.* (single parts 3*s.* 0*d.*); and *Series C. Journal of Meetings*, 6*s.* 0*d.*

As from January 1936 the journal *Stylops* is continued as *Proceedings, Series B. Taxonomy*. Copies of volumes 1 to 4 are available at £1 16*s.* 0*d.* each, post free.

PROCEEDINGS OF THE
ROYAL ENTOMOLOGICAL SOCIETY
OF LONDON

SERIES B. TAXONOMY

VOLUME 7. 1938.

THE GENUS *APTINOTHRIPS* HALIDAY. A FURTHER NOTE ON THE LARVAL STAGES (THYSANOPTERA: TEREBRANTIA)

By E. R. SPEYER, M.A., F.R.E.S.

(*Entomologist, Experimental Station, Cheshunt, Herts.*)

PROFESSOR YRJO HUKKINON has very kindly sent to me large numbers of *Aptinothrips* larvae from localities in Finland, where *A. stylifer* Tryb. occurs either in the absence of other species of the genus, or as the greatly predominant species as compared with *A. rufus* (Gmel.) Hal.

The specimens were collected during the month of June in the years 1931 to 1936 inclusive, mostly from *Alopecurus pratensis*.

Examination of the 2nd instar larvae confirms entirely the structural differences, between the above-named species, which were elucidated in 1935 *Trans. R. ent. Soc. Lond.* **83**: 503–508, figs. 23, 26–28.

The tentative distinction drawn between the 1st instar of the two species (*loc. cit.* : 507) is, however, not upheld by a study of the new material, and a careful examination of the chaetotaxy and general structure has failed to show any character by which the two species can be separated *in this particular instar*. The pair of setae upon the ventral surface of the 9th abdominal segment alluded to in the footnote to Table II and in the text p. 507 (*loc. cit.*) occurs only in specimens which are in process of ecdysis, and belongs, therefore, to the corresponding segment of the 2nd instar larva, in which it is represented in both species.

While examining the chaetotaxy of the 1st instar larvae both of *A. rufus* and *A. stylifer*, an additional pair of setae (about 4 μ in length) was detected upon the dorsum of the 1st abdominal segment: Table II, p. 507 (*loc. cit.*), therefore, requires emendation also in this respect. Each seta of this pair is placed laterally to the "median" seta of each side.

The fact that the 1st instar larvae of the two species appear to be morphologically inseparable is not surprising, nor does it provide any evidence to the effect that *A. rufus* and *A. stylifer* are even closely allied species. A similar uniformity of structure has been observed in several species of the genus *Thrips*, which, from the morphology of their later developmental stages and their imagines, are quite distinct. It is not improbable that further research will show this uniformity of structure to exist amongst at least closely allied genera, such as *Thrips*, *Taeniothrips*, and *Frankliniella*, in respect of the 1st instar larva only.

ON THE IDENTITY AND SYSTEMATIC POSITION OF TWO HITHERTO MISIDENTIFIED SPECIES OF LYCAENIDAE (LEP. RHOP.)

By Francis Hemming, C.B.E., F.R.E.S.

In the present paper I discuss the identity and systematic position of two palaearctic species of Lycaenidae. The first of these is the species described as *Papilio argyrognomon* by Bergstrasser in 1779, a species belonging to a complex of closely allied species the nomenclature of which has for many years been in a state of great confusion. The second species dealt with in the present paper was described as *Lycaena subsolanus* by Eversmann in 1851; its type now in Leningrad has not previously been examined, with the result that the identity of this species has never before been determined.

1. The Identity and Systematic Position of *Papilio argyrognomon* Bergstrasser, 1779.

Papilio argyrognomon Bergstrasser is one of three superficially similar insects the nomenclature of which has been hopelessly confused both by early and by modern authors.

Papilio argyrognomon Bergstrasser

Bergstrasser, 1779, *Nom. Ins.* **2** : 76, pl. 46, fig. 1, 2 ♀.

The above species is the type of *Lycaeides* Hübner, [1819] (*Verz. bek. Schmett.* (5) : 69). It was included in the genus by Hübner under the name *Lycaeides argus* Linnaeus, but (as shown below) that was an erroneous identification.

The nomenclature of the species included in this genus by Hübner as *argus* Linnaeus (which was selected as the type by Scudder, 1872, 4th *Ann. Rep. Peabody Acad. Sci.* **1871** : 54) is difficult to disentangle owing to the existence of three very similar palaearctic species which have been frequently confused with one another by the earlier authors, with the result that modern authors also have failed to appreciate which of the earlier names should be applied to each species. The first of these species to receive a name was named *Papilio argus* by Linnaeus in 1758 (*Syst. Nat.* ed. 10 : 483). Species No. 2 was first named (from a female example) in 1761, when Linnaeus named it *Papilio idas* (*Faun. svec.* ed. 2 : 284). But that name is invalid, since it is a homonym of *Papilio idas* Linnaeus, 1758 (*Syst. Nat.* ed. 10 : 488). Thus by the year 1761 Species No. 2 had been distinguished from Species No. 1 (= *argus* Linnaeus) and had been given an invalid name (= *idas* Linnaeus) only. The first authors to give structural differences distinguishing Species No. 1 (= *argus* Linnaeus) from Species No. 2 (then still without a valid name) were Schiffermüller and Denis (1775, *Schmett. Wien* : 184). Most unfortunately, however, these authors made the mistake of renaming Species No. 1 as *Papilio aegon* and of identifying Species No. 2 as *Papilio argus* Linnaeus. At this stage therefore Species No. 1 had one valid name (= *argus* Linnaeus), and one synonym (= *aegon* [Schiffermüller and Denis]), while Species No. 2 had still no valid name, but had one invalid name (= *idas* Linnaeus), and in addition had by error been given the name *argus* Linnaeus. The above error was undetected for nearly one hundred years until in 1871 Kirby (Syn. Cat. diurn. Lep. : 357) pointed out that the name *argus* Linnaeus belonged to Species No. 1 (as explained above) and not to Species No. 2. Kirby therefore quite correctly adopted the

name *argus* Linnaeus for Species No. 1, to which he sank *aegon* [Schiffermüller and Denis] as a synonym. Kirby realised that in these circumstances it would be necessary to find a name for Species No. 2, which he had just deprived of the name *argus* Linnaeus, to which of course it had never been entitled. Kirby therefore looked round the old literature and applied to Species No. 2 the name *Papilio argyrognomon* Bergstrasser, 1779 (*Nom. Ins.* **2** : 76, pl. 46, fig. 1, 2 ♀), that being, as it seemed to him, the oldest valid name for Species No. 2. In the course of the next forty or fifty years the rearrangement of the nomenclature of Species No. 1 and No. 2 came gradually into use, and until recently was the general practice as regards these two species.

It was not until 1917 that Chapman demonstrated the existence of Species No. 3, differing structurally both from Species No. 1 and from Species No. 2, but considerably closer to the latter than to the former. This hitherto unrecognised species he named *Lycaena aegus* Chapman (1917, *in* Oberthür, *Et. Lép. comp.* **14** : 42–53, pl. 20, fig. 60). It was not long before it was discovered that *Lycaena argus* Linnaeus, var. *ligurica* Oberthür, 1910 (*Et. Lép. comp.* **4** : 201–202, pl. 41, fig. 293 ♂, 294 ♀) was cospecific with *Lycaena aegus* Chapman, 1917. For a time therefore Species No. 3 was known collectively as *Lycaena ligurica* Oberthür. In the years 1930 to 1933, discussion turned to the identity of *Polyommatus ismenias* Meigen (1829, *Syst. Beschr. europ. Schmett.* **2** (1) : 33, pl. 49, fig. A, B ♂, C, D ♀). As a result of this discussion, the leaders of which were Heydemann (1930, 1931, 1932), Beuret (1931, 1932), Stempffer and Schmidt (1932), and Stempffer (1932, 1933), it became evident that *ismenias* Meigen was cospecific with *ligurica* Oberthür and *aegus* Chapman, and therefore that Species No. 3 should in future be known as *ismenias* Meigen. The final stage of this complicated story was reached in 1935, when Beuret (*Lambillionea* **35** : 162–172) demonstrated that the insect described and figured by Bergstrasser in 1779 as *Papilio argyrognomon* was not a form of Species No. 2 (as it had come to be regarded since Kirby had applied the name in 1871 to that species), but was in fact a form of Species No. 3. The result of this discovery was (*a*) that the oldest valid name for Species No. 3 was seen to be *argyrognomon* Bergstrasser, and (*b*) that the question of the oldest valid name for Species No. 2 (for which *argyrognomon* Bergstrasser was no longer available) was once more reopened. Beuret suggested that to minimise the confusion which was in any case unavoidable the name *argyrognomon* Bergstrasser should be retained for Species No. 2, notwithstanding the fact that (as he had himself very clearly shown) Bergstrasser had himself applied it to Species No. 3 and the fact (very relevant in this connection) that (as he had himself also shown) a subspecies of Species No. 2 occurs in the same locality as that in which the types of *argyrognomon* Bergstrasser (= Species No. 3) were taken. Verity suggested that a return should be made to a suggestion which he had made many years before (1913, *J. linn. Soc. Lond.* (*Zool.*) **23** : 189) that Species No. 2 should be known by the invalid name *idas* Linnaeus.

I have carefully considered both the above suggestions, and I can find in neither any grounds that would appear acceptable, if the case were submitted (as has been suggested) to the International Commission on Zoological Nomenclature. Verity's suggestion that the Commission should agree to suspend the rules in such a way as to validate a name (= *idas* Linnaeus) which is invalid by reason of its being a homonym, raises a question of principle of great importance. In my opinion, there would need to be very strong grounds indeed to justify any relaxation of the rules in such a case, since Article 35 of the Code states categorically that such names are to be rejected. Beuret's suggestion

that the name *argyrognomon* Bergstrasser should be applied to Species No. 2 (to which Bergstrasser never applied it) and not to Species No. 3, to which he did apply it, is also open to grave objection. If effect were given to this proposal, we should be faced with the position that the original description and figures of *argyrognomon* Bergstrasser applied to one (= Species No. 3), while in future the name would be applied to a wholly different species (= Species No. 2). Under this arrangement, Species No. 2 would have a name (*argyrognomon* Bergstrasser) arbitrarily applied to it, but it would have no original description, no original figures, and no type locality.

In this connection it is necessary to bear in mind also what are the actual powers conferred upon the International Commission by the International Zoological Congress. They are defined as authorising the Commission (under certain conditions) to suspend the rules in any given case " where in its judgment the strict application of the rules will clearly result in greater confusion than uniformity." This essential condition would not be satisfied in the present case. Species No. 3 has only been distinguished as a separate species for twenty years; it is still a relatively little known species without any large literature associated with it; Species No. 2 would, under the strict application of the rules, now bear the name *Argus calliopis* Boisduval, 1832; no one has ever had any doubt as to the specific identity of *calliopis* Boisduval; the change of the name of Species No. 2 from *argyrognomon* (*false*) Bergstrasser to *calliopis* Boisduval would cause some inconvenience, but it would not possibly cause any confusion. My conclusion is therefore that there are no adequate grounds for seeking a suspension of the rules in this case, and therefore that in future Species No. 2 (hitherto wrongly known as *argyrognomon* Bergstrasser) should be called *calliopis* Boisduval.

In order to facilitate the consideration of the history of this case, I give below a summary of the synonymy involved :—

Species No. 1.	*Species No.* 2.	*Species No.* 3.
(*a*) Validly named *Papilio argus* by Linnaeus in 1758. (*b*) Renamed *Papilio aegon* in 1775 by Schiffermüller and Denis. (*c*) Generally known as *aegon* until 1871, when Kirby pointed out that this species should be known as *argus* Linnaeus. (*d*) Now universally known as *argus* Linnaeus.	(*a*) Named *Papilio idas* in 1761 by Linnaeus, but this name is invalid, because it is a homonym. (*b*) Misidentified as *argus* Linnaeus by Schiffermüller and Denis in 1775. (*c*) Generally known as *argus* Linnaeus (of course wrongly) until 1871, when Kirby pointed out that this was inadmissible. (*d*) In 1871 Kirby applied to this species the name *Papilio argyrognomon* Bergstrasser, 1779. (*e*) Beuret's proof in 1935 that the insect described and figured by Bergstrasser as *argyrognomon* was not this species, but Species No. 3.	(*a*) First distinguished by structural characters in 1917 by Chapman, who named it *Lycaena aegus*. (*b*) Was next identified (specifically, though not subspecifically) with the insect described by Oberthür as *Lycaena argus* Linnaeus, var. *ligurica* in 1910. (*c*) Was known as *ligurica* Oberthür or as *ligurica* Courvoisier (by whom the name had been published almost simultaneously) until in period 1930–33 it was established by Heydemann, Beuret, Stempffer and Schmidt that it was cospecific with the insect described by Meigen in 1829 as *Polyommatus ismenias*.

Species No. 1.	*Species No.* 2.	*Species No.* 3.
	(*f*) The earliest valid name for this species is *Argus calliopis* Boisduval, 1832.	(*d*) Was shown by Beuret in 1935 to be the same species as that described by Bergstrasser as *Papilio argyrognomon* in 1779. (*e*) The oldest valid name for this species is therefore *Papilio argyrognomon* Bergstrasser, 1779.
(*e*) The correct name for this *Plebejus argus* (Linnaeus, 1758).	(*g*) The correct name for this species is *Lycaeides calliopis* (Boisduval, 1832).	(*f*) The correct name for this species is *Lycaeides argyrognomon* (Bergstrasser, 1779).

2. The identity and systematic position of *Lycaena subsolanus* Eversmann, 1851.

One of the numerous difficulties which have hitherto made it impossible satisfactorily to revise the group of species of LYCAENIDAE belonging to the genera *Plebejus* Kluk, 1802, and *Lycaeides* Hübner, [1819], has been the difficulty of determining with certainty the identity of the species described as *Lycaena subsolanus* by Eversmann in 1851 (Eversmann, 1851, *Bull. Soc. imp. Nat. Moscou* **24** (Pt. 1), (2) : 620–621). Eversmann's original description reads as follows :—

Lycaena subsolanus.

L. alis superne basi caeruleis, externe nigro-fuscis : nervis nigris, ciliis albis ;—subtus albido-cinereis : lunula discoidali, serie flexuosa serieque submarginali duplici punctorum nigrorum, hac lunulis fulvis signata ; alis posticis praeterea punctis basalibus nigris quatuor punctisque nonnullis seriei limbalis externae argenteo-notatis. Mas.

Nous ne connaissons que le mâle de cette espèce, qui habite les environs d'Irkoutzk. Il a à peu près la taille et le port d'*icarius* : envergure 16 lignes ; et il ressemble par son dessus à quelques individus d'*arion* ou d'*euphemus*, nommément à ceux dont le dessus est dépourvu de points noirs ; son dessous ressemble à celui de l'*argus*.

La moitié basale des quatre ailes du dessus est d'un bleu un peu argenté, qui se perd insensiblement dans le noirâtre de l'extrémité. Toutes les nervures sont noires. La frange est d'un blanc uniforme.

Le dessous des quatre ailes est d'un gris cendré très pâle. Chaque aile est marquée d'une petite lunule discoïdale noire, d'une rangée flexée de points noirs, et de deux rangées limbales, dont l'interne est composée de petits capuchons noirs, l'externe offre des points noirs ; l'espace entre ces deux rangées est occupé de petites taches fauves. Plusieurs points de la rangée externe des ailes inférieures sont marqués d'argentin. Ces mêmes ailes offrent encore quatre points noirs basals, dont les ailes supérieures sont dépourvues. La frange des quatre ailes est séparée du fond par une ligne noire, marquée de petites taches noires triangulaires, comme dans l'*argus*.

In the first edition of his Catalogue, Staudinger (Staudinger, 1861, *in* Staudinger and Wocke, *Cat. Lep. Eur.* : 5, no. 108) treated Eversmann's insect as a distinct species, and retained it in the genus *Lycaena* Fabricius.

He placed a dagger mark against it, however, thus signifying that he had not been able to study the original description. In the second edition of his catalogue published ten years later, Staudinger (Staudinger, 1871, *in* Staudinger and Wocke, *Cat. Lep. europ. Faun* : 10, no. 137) retained *subsolanus* Eversmann in the genus *Lycaena* Fabricius and identified it with *Lycaena lucifera* Staudinger (1867, *Ent. Ztg, Stettin*, **28** : 100), which he accordingly sank as a synonym of *Lycaena subsolanus* Eversmann. He added a note that he based this identification on information received from Lederer. In 1892, Staudinger (1892, *Deuts. ent. Z. ' Iris,'* **5** : 316) again considered the identity of this insect. On this occasion he revived the name *Lycaena lucifera* Staudinger, remarking that Eversmann's description of *Lycaena subsolanus,* to which he had sunk it as a synonym in 1871, was unrecognisable. He added that according to Alpheraky *Lycaena subsolanus* Eversmann was " *zweifellos eine etwas variirende Form von Lyc. Argus.*" In the third edition of his catalogue (Staudinger, 1901, *in* Staudinger and Rebel, *Cat. Lep. pal. Faun.* **1** : 78, no. 544), he no longer regarded Eversmann's description as unrecognisable, having decided to accept Alpheraky's identification of *subsolanus* Eversmann with the insect which in 1892 he had called *Lycaena argus* (Linnaeus) and which he now called *Lycaena argyrognomon* (Bergstrasser).* In making this identification, Staudinger added the following note : " *una* ♀ *nec* ♂ *condita ; teste* Alph. *certe Argyrogn. ab.*" Staudinger's identification of this insect was adopted by Seitz (Seitz, 1909, *Grossschmett. Erde* **1** : 301), who stated that Eversmann's *subsolanus* was probably only an individual form of *Lycaena argyrognomon* (Bergstrasser) * in which the basal half of both wings above was bluish with a little silver, the underside recalling *arion* Linnaeus and *euphemus* Hübner.

In 1917, Chapman published a paper (Chapman, 1917, *in* Oberthür, *Et. Lép. comp.* **14** : 41–57), in which he showed that the insect called *Lycaena argyrognomon* (Bergstrasser) * by Staudinger in 1901 was confined to Europe, and that what had previously been regarded as its Chinese and Japanese subspecies should be treated in future as belonging to a separate species. Unfortunately, Chapman applied to this hitherto unrecognised species the name *Lycaena micrargus* Butler, 1878. Butler's *micrargus* is, as I have since shown (Hemming, 1932, *Stylops* **1** : 175–176), the Japanese subspecies of *Plebejus argus* (Linnaeus, 1758). In the same article (*ibid.* : 178), I pointed out that it would be necessary to determine which was the oldest of what until Chapman's paper in 1917 had been regarded as the named Asiatic forms of *Lycaena argyrognomon* (Bergstrasser),* in order to ascertain what was the specific name of the Chinese and Japanese species which he had there misidentified as *Lycaena micrargus* Butler. The oldest of those names was *Lycaena subsolanus* Eversmann, but in view of the uncertainty that then attached to its identification (by Alpheraky and Staudinger) with what they called *Lycaena argyrognomon* (Bergstrasser), and therefore with the Asiatic species which Chapman had misidentified with *Lycaena micrargus* Butler, I thought it better at that time to leave the question of the specific name of Chapman's Chinese and Japanese species (his *micrargus*) as " an open question."

* This insect is the well-known European species which was first clearly distinguished from *Plebejus argus* (Linnaeus, 1758) by Schiffermüller and Denis in 1775. Unfortunately those authors made the mistake of renaming *Papilio argus* Linnaeus, 1758, as *Papilio aegon* Schiffermüller and Denis, and of applying the name *Papilio argus* Linnaeus to the new species the existence of which they had just detected. This initial mistake gave rise to the chain of errors of identification discussed on pp. 2–5 above. As shown on p. 5 above, the correct modern name for the insect misidentified by Schiffermüller and Denis (1775) and by Staudinger (1892) as *Papilio argus* Linnaeus, 1758, and by Staudinger (1901) as *Papilio argyrognomon* Bergstrasser, 1779, is *Lycaeides calliopis* (Boisduval, 1832).

After the publication in 1932 of the paper referred to above, I learnt from Dr. B. P. Uvarov that Eversmann's collection, which included the types of the species described by him in 1851, had passed into the possession of the Zoological Institution of the Academy of Sciences of the U.S.S.R. at Leningrad. Through Dr. Uvarov's kind offices, I was placed in touch with M. N. Filipjev, Curator of the Lepidoptera Section of the Entomological Department of the above Institution. M. Filipjev very kindly undertook to examine the Eversmann collection and to inform me whether Eversmann's type of *Lycaena subsolanus* Eversmann was still in existence. Subsequently, M. Filipjev wrote saying : " The type is preserved in our collection; it is in bad condition, but the antennae are present. It is labelled ' Irkutsk.' It is unique, and certainly a male, not a female. I send you a photograph." The photograph there referred to represents the upperside and is reproduced here as fig. 1. Later, in response to a further request, M. Filipjev very kindly sent me a photograph of the underside of Eversmann's type, which is reproduced here as fig. 2. I desire to take this opportunity of expressing my warm thanks to the authorities of the Zoological Institution at Leningrad and to M. Filipjev for the invaluable help which they have rendered to me in this matter.

The photographs here given of the two surfaces of Eversmann's type of *Lycaena subsolanus* Eversmann immediately dispel all doubt as to the identity

of that insect. It is beyond all question a male of the insect which Bremer named *Lycaena cleobis* in 1861 (Bremer, 1861, *Bull. Acad. Sci. St. Petersb.* **3** : 472). Eversmann's name has ten years' priority over Bremer's *cleobis*, and this species must therefore in future be known as *Lycaeides subsolanus* (Eversmann). I place it in the genus *Lycaeides* Hübner, [1819], since an examination of its male genitalia shows beyond question that it is congeneric with *Lycaeides argyrognomon* (Bergstrasser), the type of *Lycaeides* Hübner. To the discussion regarding this generic name in my *Generic Names of the Holarctic Butterflies* (**1** : 107–108), published in 1934, it is only necessary here to add that at its meeting held in Lisbon in September 1935 the International Commission on Zoological Nomenclature agreed upon a suspension of the rules in the case of the name *Lycaeides* Hübner, and finally designated *Papilio argyrognomon* Bergstrasser as its type.

As stated in Eversmann's original description and as confirmed by M. Filipjev's examination of Eversmann's type, the type locality of *Lycaeides subsolanus* (Eversmann) is Irkutsk. Bremer described his *cleobis* from " Nordseite des Baikal Sees; in Daurien und dem Bureja Gebirge, zwischen der Ussuri-Mundung und dem Noor." Since Irkutsk is situated on the north-western shore of Lake Baikal, the type locality of *subsolanus* Eversmann is identical with the first of the localities given by Bremer in his original description of *cleobis*. The latter name is thus an absolute synonym of *subsolanus* Eversmann, and is not even available as a subspecific name.

NEW AUSTRALIAN CURCULIONIDAE (COL.)

By Sir Guy A. K. Marshall, C.M.G., F.R.S.

Of the seven species here described, the five from Queensland were kindly submitted by Mr. R. Veitch, Chief Entomologist and Director of Research, Department of Agriculture, Queensland. The types of all the species have been deposited in the British Museum.

Otiorrhynchinae.

Neomerimnetes flindersiae sp. n.

♂♀. Derm red-brown, with dense brown and grey scaling; prothorax brown, with an indistinct darker median stripe and a broad dark stripe on the pleurae; elytra dorsally light brown more or less heavily mottled with dark brown, the lateral margins grey or brownish-grey as far as stria 7, a variable oblique greyish discal stripe starting from the lateral stripe before the middle and reaching stria 2 behind the middle, a rather conspicuous variable dark patch immediately behind it, and the apical area more or less suffused with grey; underside with uniform dense grey scaling.

Head with dense brown scaling that entirely conceals the sculpture and a narrow pale ring round the eyes, which are moderately convex, the forehead flat. *Rostrum* longer than broad, a little longer than the head, parallel-sided in the basal half, roundly dilated in front; the sides almost vertically declivous in the basal half, the dorsal area flat, with dense scaling hiding the sculpture and dark recumbent setae, the apical area with sparse submetallic scales; the small epistome triangular, flat, shallowly punctate. *Antennae* red-brown, the scape slight exceeding the hind margin of the eye, squamose and with dark recumbent setae; funicle with joint 1 as long as 2 + 3, 3–6 subequal and slightly longer than broad, 7 a little broader. *Prothorax* transverse, strongly rounded laterally, broadest at the middle, shallowly constricted near the apex, the constriction continued broadly across the dorsum, truncate at base and apex, the base broader; the dorsum slightly convex longitudinally, highest at the middle, with the surface even, the sculpture being entirely hidden by scaling. *Scutellum* small, round, slightly elevated, with dense grey scaling. *Elytra* ovate, narrower in ♂, widest at the middle, with a small humeral prominence in ♀, which is much less conspicuous in ♂; the dorsal outline rising rather rapidly at the base, then gently convex, and perpendicularly declivous at the apex—rather more abruptly so in ♀; the punctures in the striae clearly visible through the scaling, scarcely diminishing behind, separated by about their own length; the intervals broader than the striae, slightly convex, each with a row of short spatulate suberect curved setae, interval 1 slightly elevated posteriorly, especially in ♂.

Length 3·0–3·5 mm., breadth 1·5–1·7 mm.

Queensland: Imbil, 6 ♂♂, 7 ♀♀, on *Flindersia australis*, xii.1936 (*A. R. Brimblecombe*).

The genotype, *N. destructor* Blkb. 1900, is a much smaller insect, with the prothorax nearly as long as broad and the apex almost as wide as the base; the scutellum is inconspicuous and not convex; and the elytra lack the humeral prominence and the oblique pale stripe.

The two Queensland species described by Lea (1910), *inflatus* and *sobrinus*, have the prothorax granulate (whereas in *flindersiae*, when the scales are removed, it has very dense subconfluent punctures but no granules), and the elytra have no humeral prominence or oblique pale stripe.

HYLOBIINAE.

Imbilius gen. n.

Head pyriform, the temples a little shorter than the eyes, which scarcely project beyond them, the forehead narrower than the base of the rostrum. *Rostrum* comparatively long and slender, gently curved; the scrobes passing obliquely beneath the rostrum, commencing at one-third from the apex; mandibles bidentate, with a basal seta; mentum small, transverse, the usual two long suberect setae on the submentum absent. *Antennae* with the scape clavate, reaching the middle of the eye; the club elongate, subpyriform, as long as joints 2–7 of the funicle, the basal joint shorter than the rest together, the sutures transverse; joint 7 of the funicle not annexed to the club. *Prothorax* gently arcuate at the base, the apical margin very obliquely truncate laterally, without postocular lobes. *Elytra* elongate, a little wider than the prothorax, separately acuminate at the apex, with stria 10 abbreviated. *Legs* with the femora moderately clavate, with a small obtuse tooth, the hind pair not nearly reaching the apex of the elytra; tibiae rather short and deep, compressed, shallowly bisinuate on the lower edge, uncinate and with a short mucro on the anterior pair, the hind corbels entirely apical, not ascending; tarsi rather short, joint 3 broadly bilobate, the claws free. *Sternum* with the front coxae contiguous, the prosternum not sulcate, the gular margin broadly sinuate, the metasternum elongate. *Venter* with the intercoxal process rather sharply angulate, produced beyond the coxae; ventrite 2 longer than 3 + 4.

Genotype : *Imbilius araucariae* sp. n.
An isolated genus belonging to the subtribe Hylobiina.

FIG. 1.—*Imbilius araucariae* gen. et sp. n.

Imbilius araucariae sp. n. (fig. 1).

♂♀. Derm red-brown, with dense cinnamon-brown scaling; prothorax with two small round blackish spots in the middle of the disk, a short white line at the base of the lateral margin, and three small white spots along the basal margin (sometimes absent); elytra with a short white humeral line continuous with that on the prothorax and scattered white scales along the striae, also the following blackish spots : one or two at or before the middle

in stria 1 (very variable in occurrence and position), one before the middle in 9, and sometimes one behind the middle in 8; underside with dense brown scaling at the sides of the sternum, and sparse scaling in the middle and on the venter.

Head with the sculpture hidden by dense brown scaling. *Rostrum* shorter than the pronotum (3 : 4), indistinctly tricarinate on the squamose posterior part, and with fine separated punctures anteriorly. *Antennae* with joint 1 of the funicle as long as 2 + 3, joints 3–7 transverse. *Prothorax* very nearly as long as broad, parallel-sided in the basal third, then narrowing in a curve to the apex without any constriction; the dorsum feebly convex longitudinally, quite smooth, with the sculpture entirely hidden by scaling. *Scutellum* small, round, with dense grey scaling. *Elytra* elongate, subtruncate at the base, parallel-sided from the obliquely rounded shoulders to two-thirds, then rapidly narrowing to the acute triangular apical processes; the very shallow striae with small separated indistinct punctures, each covered by a scale; the intervals broad and with minute inconspicuous appressed setae, interval 1 subcostate on the apical half, 3 strongly costate on the basal half, 5 costate from near the base to the apex being highest and subangulate at the top of the declivity. *Legs* red-brown, with sparser pale brown scaling, finely rugosely punctate.

Length 4·0–4·5 mm., breadth 1·5–1·7 mm.

Queensland: Imbil, 2 ♂♂, 4 ♀♀, bred from *Araucaria cunninghamii*, xi.1936 (*A. R. Brimblecombe*).

Erirrhininae.

Glaucopela acaciae sp. n.

♂♀. Derm shiny black, the apical margin of the elytra, the antennae and legs testaceous, with the tarsi infuscated; prothorax clothed broadly at the sides with white scales (which extend narrowly across the base) enclosing an indefinite round dark spot on the anterior half, the discal area covered with dark brown scales enclosing a broad median white stripe on the basal half, and on the anterior half a narrow abbreviated white line, which sometimes unites with the basal stripe; elytra with a sutural stripe of dense white scales broadly interrupted about the middle by a patch of dark brown scales, the other intervals with a double row of narrow white scales more or less interrupted as follows: an irregular transverse brown band at one-fourth from the base expanding laterally to form a large humeral patch, another band about the middle extending laterally to interval 8, and usually a variable brown spot at the apex of 7 and 8, but 5 usually brown throughout except at base and apex and 6 white throughout; underside with uniform dense white scaling.

Head with fine dense rugose punctures which are mostly hidden by white scales that are sparser on the vertex, the forehead narrower than an eye and only half as wide as the base of the rostrum; eyes rather narrowly ovate and sharply pointed below. *Rostrum* quite similar in the two sexes, gently curved, almost cylindrical, but widening at the extreme base, which is densely clothed with white scales, the remainder of the rostrum quite bare and shiny with sparse small punctures dorsally and a lateral row of large close punctures from the scrobe to the apex. *Antennae* inserted at only one-fifth from the base of the rostrum; scape unusually short, shorter than joint 1 of the funicle, which is slightly longer than 2. *Prothorax* transverse (5 : 7), gradually narrowing from base to apex, with the sides only slightly rounded; the dorsum convex, highest in the middle, with the dense punctation almost entirely hidden by scaling; the scales in the basal half of the lateral white areas much broader than the others. *Elytra* longer than broad (5 : 4), very gradually narrowing posteriorly from behind the shoulders; the deep striae fully visible, with close punctures each containing a minute recumbent white seta; the intervals broader than the striae, slightly convex, with the narrow setiform scales slightly raised. *Legs* yellow (except the fuscous

tarsi), with rather dense narrow white scales; tibiae not widened at the apex, the anterior pairs with a strong curved black mucro; joint 3 of the tarsi only slightly wider than 2.

Length 2·0–2·4 mm., breadth 1·0–1·1 mm.

Central Australia: Macdonald Downs, 180 miles N.E. of Alice Springs, 3 ♂♂, 2 ♀♀, bred from galls on "mulga" (*Acacia aneura*), x.1934 (*Prof. J. B. Cleland*).

The specimens were forwarded by Mr. D. C. Swan, of the Waite Agricultural Research Institute.

The genotype, *Glaucopela unicolor* Pasc., differs from all the subsequently described species, including the present one, in the formation of the forehead, which is as broad as the base of the rostrum and broader than an eye.

G. acaciae differs from the remaining species in its distinctive colouring, the nature of its scaling, and its yellow femora. The scape is longer than the first funicular joint in all the other species except *fuscomarmorea* and *varipes* Blkb., which are distinguished by having the front coxae separated, a character which was not mentioned by Blackburn.

It is probable that the galls on the *Acacia* were not caused by the weevils, but by a Perilampid wasp which was also bred from them, for this wasp, *Trichilogaster* sp., belongs to a genus which is known to make galls on acacias.

Cryptorrhynchinae.

Pseudapries crux sp. n.

♂♀. Black, with dense dark brown scaling and conspicuous white markings; prothorax entirely brown above, the pleurae entirely white; elytra brown with a large common X-shaped white patch extending from the base to the upper part of the declivity, the anterior arms much longer and narrower, diverging obliquely and reaching the base at the shoulders, the posterior arms short and broad, diverging transversely and reaching interval 5; the triangular area between the anterior arms sometimes grey with brown patches; underside whitish on the middle of the sternum and the two basal ventrites and turning to brown laterally, ventrite 2 with two brown spots on the posterior edge, the last three ventrites brown in the middle and becoming whitish laterally.

Head brown, with the following whitish markings: two longitudinal patches on the vertex, a patch above each eye, and two spots on the forehead (sometimes coalescing). *Prothorax* as long as broad, widest close to base, gradually narrowing in front, shallowly constricted near the apex, the constriction continued broadly and shallowly across the dorsum, the base shallowly bisinuate, the dorsum almost flat, set with small dense rugulose punctures and with two very indistinct small depressions in the middle of the disk, without any median sulcus; a series of short erect clavate scales along the lateral margin on the basal half and along the apical margin (interrupted in the middle), and a transverse row of four small tufts of similar scales beyond the middle. *Scutellum* small, elevated, subconical, with dense brownish-grey scaling. *Elytra* a little wider than the prothorax, trisinuate at the base, parallel-sided from the shoulders to beyond the middle; the punctures in the narrow striae almost or entirely concealed by dense overlapping scales, the alternate intervals with a row of small tufts of short erect scales, and a short tufted ridge at the base of interval 3. *Legs* whitish, the femora with a black patch at the middle and at the apex, the tibiae with the basal half black; the femora not sulcate beneath and all edentate. *Underside* with dense scaling entirely concealing the punctures.

Length 2·5–3·7 mm., breadth 1·1–1·5 mm.

Queensland: Imbil, 2 ♂♂, 8 ♀♀, bred from hoop pine (*Araucaria cunninghamii*), viii–xi.1936 (*A. R. Brimblecombe*).

A very distinct species on account of its striking coloration and the absence of deep foveae on the pronotum.

Cossoninae.

Stereoderus lucens sp. n.

♀. Uniform shiny black, with the antennae and tarsi red-brown.

Head shiny, with small separated punctures, an indistinct abbreviated median stria, and two very small approximated granules near its anterior margin. *Rostrum* transverse, subparallel-sided, almost symmetrical, but the right side a little longer than the left, the punctures like those on the forehead but more dense; the genae fringed beneath with moderately long dense whitish hairs. *Prothorax* longer than broad, scarcely rounded laterally in the middle, rapidly narrowed at the base, rather abruptly constricted and tubulate at the apex, the constriction continued very shallowly across the disk; the dorsum with distinct separated punctures which are somewhat denser anteriorly, and an impunctate median stripe on the basal two-thirds. *Scutellum* subquadrate, impunctate. *Elytra* with the five dorsal rows of punctures striate only near the base, the punctures not or only slightly diminishing behind, those in row 1 denser than the others; the lateral rows much more finely punctate than the dorsal ones, 9 shallowly and 10 deeply striate on the basal third, 10 broadly interrupted in the middle; the intervals with an irregular row of very fine punctures. *Sternum* with very fine sparse punctures in the middle, which become much larger laterally; mesepimeron not impressed, with a row of punctures.

Length 5·0–5·5 mm., breadth 1·4–1·5 mm.

Queensland: Gadgarra, 3 ♀♀, from a walnut tree, xi.1934 (*J. H. Smith*).

Stereoderus pacificus Woll., from Fiji, is very similar in appearance, but the punctures on the head and prothorax are much more sparse; the rostrum has no long dense hairs beneath (even in the ♂) and dorsally it bears a small conical tubercle in the middle of the disk.

The only species previously described from Australia, *S. macleayi* Lea, differs, according to the description, in having the head and rostrum almost impunctate; the rostrum has three small tubercles close to the apical margin and the mouth-parts with long reddish hairs; and the intervals on the elytra are impunctate.

Omeretes gen. n.

Body cylindrical, transversely convex. *Head* more or less shallowly constricted at some distance behind the eyes, which are slightly convex and much shorter than the temples; forehead strongly convex transversely. *Rostrum* about as long as broad, not dilated at the base; scrobes commencing at one-third from the apex, running longitudinally straight up to the eye, then bending sharply downwards close along the anterior margin of the eye, but not continued on the lower surface of the head; mandibles concealed from above when closed. *Antennae* inserted near the base of the rostrum; scape longer than the funicle, gradually clavate, strongly curved, reaching or exceeding the hind margin of the eye; funicle short and stout, joint 1 as long as or longer than broad, the remaining joints strongly transverse; club almost circular in one aspect, much compressed and not wider than the funicle in the other aspect. *Scutellum* distinct, rounded, sloping forwards. *Elytra* not wider than the prothorax, deeply striate, with five dorsal striae reaching the base. *Legs* with the tibiae widening distally, with a stout uncus but a small mucro, the front pair sinuate on the lower edge but without a tooth, excavate on the external face for the reception of the tarsus; tarsi with joint 3 not broader than 2; trochanters of the genotype with a strong seta, but not in the other species. *Sternum* with the prosternal process as wide as a coxa, the mesosternal one wider than a coxa.

Genotype : *Omeretes podocarpi* sp. n.

Having somewhat the facies and convex form of *Eremotes* Woll., which differs in having the scrobes oblique and not angulate; the scape is shorter than the funicle and does not reach the hind margin of the eye; the prosternal and mesosternal processes are both much narrower than their adjoining coxae.

The known species of *Coptus* Woll. are much smaller and flatter insects, but have similar scrobes and antennae; they differ, however, in having the cephalic constriction adjoining the eyes, which are much longer than the temples; the longitudinal part of the scrobes is less than half the length of the rostrum and the vertical part continues backwards beneath the head; the prosternal process is only half the width of a coxa, and the mesosternal one is as wide as a coxa.

Coptus subcarinatus Fst., 1898, should be transferred to this genus.

Omeretes podocarpi sp. n.

Uniform red-brown, with the club of the antennae paler.

Head with strong separated punctures, except on the vertex, which is almost impunctate, not constricted, with a round median fovea behind the eyes, which are a little more convex than the temples. *Rostrum* about as long as broad, subparallel-sided, with close distinct punctures throughout and a shallow median impression near the apex. *Antennae* with the scape reaching the base of the eye. *Prothorax* about as long as broad, rounded laterally in the posterior half, widest at one-third from the base, constricted and subtubulate at the apex, the constriction not continued across the disk, the base not marginate; the dorsum with distinct even punctures separated by about their own width, with a variable abbreviated impunctate median stripe; the pleurae with similar punctures. *Elytra* with deep striae containing strong close punctures; striae 4 and 5 not uniting at their apices, 3 and 6 uniting, 9 and 10 coalescing on a level with the apex of ventrite 1; interval 9 strongly costate on the posterior third, uniting first with 7 and continuing round the apex to join interval 1, so that the true apical margin is invisible from above; the dorsal intervals broader than the striae, with a row of very small spaced punctures. *Underside* with strong dense punctation throughout the venter, the punctures on the metasternum more sparse.

Length 2·5–3·0 mm., breadth 0·7–0·8 mm.

Queensland : Gadgarra, 2 specimens, from *Podocarpus amara*, ii.1932 (*Fielding*); Gadgarra, 10 specimens, from "black pine," iv.1934 (*J. N. Smith*).

Omeretes onychialis sp. n.

Red-brown, with the apical margins of the rostrum and prothorax, and the base and apex of the femora, more or less infuscated.

Head very shallowly constricted half-way between the eyes and the base, with strong separated punctures extending more sparsely on to the vertex; eyes more convex than the temples. *Rostrum* as long as broad, almost parallel-sided, with punctures similar to those on the forehead but more dense, and with a very shallow indefinite longitudinal median impression. *Antennae* with the scape extending well behind the eye. *Prothorax* longer than broad (5 : 4), rounded laterally, widest at one-fifth from the base, gradually narrowed in front, broadly constricted near the apex, the constriction continued very shallowly across the disk, the apex shallowly sinuate in the middle, the base narrowly marginate; the dorsum with rather close but separated punctures which are denser in the subapical constriction, and with an abbreviated smooth median line; the pleurae with much larger shallow punctures. *Elytra* with close deep punctures in the striae, striae 4 and 5, and 7 and 8, uniting at their apices, stria 3 isolated, 10 complete; the dorsal intervals broader

than the striae, with a row of distinct punctures, interval 9 finely carinate on its upper edge behind the middle and costate for a short distance only at its apex, where it unites with 3, the apical margin clearly visible from above. *Legs* with the femora more slender than in the other species, and joint 4 of the tarsi unusually compressed in the basal half, being very narrow when viewed vertically. *Underside* with the metasternum and venter fairly closely and similarly punctate.

Length 3·2–4·5 mm., breadth 1·0–1·3 mm.

Victoria: Cockatoo Creek, 4 specimens, xii.1936 (*J. C. Goudie*).

The distinctive characters of *O.* (*Coptus*) *subcarinatus* Fst., from South India, are as follows:—Head shallowly constricted laterally; rostrum without any dorsal impression; scape reaching hind margin of eye; prothorax with the base marginate; elytra with the dorsal intervals more convex and not broader than the striae, striae 4 and 5 uniting at their apices, 9 and 10 coalescing on a level with the hind coxa; interval 9 not strongly costate, uniting with 7, 3 and 2, the apical margin plainly visible from above; venter less densely punctate than the metasternum.

SOME NEW MACROLININAE (COLEOPTERA: PASSALIDAE)

By W. D. Hincks, M.P.S., F.R.E.S.

The new species of Passalidae described below belong to the Indo-Australian subfamily Macrolininae and have come to my notice in the course of work on collections of Passalid material sent for identification by various museums. In connection with the present contribution I wish to express my thanks to the following who have been kind enough to send specimens for examination—Sir Guy A. K. Marshall (Imperial Institute of Entomology), Mr. M. A. Lieftinck (Zoological Museum, Buitenzorg), and Mr. G. A. Kerrich (University Museum, Cambridge).

Macrolinus puncticollis sp. n.

Antennae with 6-lamellate club; lamellae long and when club is closed their inner margin forms a more or less straight line. *Head.* Anterior margin of labrum straight; inner and outer tubercles (when viewed from above) appear to be close together and situated on the anterior margin of head; if the insect is tilted it will be seen that the inner tubercles are placed above and to the inner side of the outer tubercles; the line between the inner tubercles is slightly concave, and between these tubercles and the outer tubercles there is a narrow perpendicular portion of the head; the frontal area triangular in outline and rather small, uneven and sparingly punctate; depressed areas of head strongly punctate. *Pronotum* with sides and posterior angles with hair-bearing punctures; anterior margin without hair; median groove present but interrupted in

front and behind; disc impunctate. *Elytra* with grooves more strongly punctured laterad; shoulders with tuft of hairs. *Mentum* with median portion impunctate except for one or two isolated punctures; side pieces strongly punctate. *Mesosternum* with strongly punctured scars and hair-bearing punctures at the base mesad. *Metasternum.* Anterior intermediate areas and lateral areas with hair-bearing punctures; disc impunctate; posterior intermediate areas with one or two isolated punctures. *Abdomen.* Lateral scars with hair-bearing punctures; last sternite with a marginal groove on either side uniting mesad with an indistinct longitudinal raised ridge.

Measurements. Length, 26·5 mm.; pronotal length, 5 mm.; width, 6·5 mm.; elytral length, 16·5 mm.; width, 8 mm.

Locality: Java: Kawah Kamodja 1600 m. 19.iv.30. *M. A. Lieftinck.*

Type: Unique in Zoological Museum, Buitenzorg.

A distinct species running down with Gravely's table * to his rubric 9 and intermediate between the two sections which fall under it. The small frontal area and large inner tubercles on the one hand ally *M. puncticollis* with *M. depressus* Grav. and *M. batesi* Kuw. whilst the punctured frontal area and more or less straight connecting ridge between the inner tubercles suggest relationship with the *latipennis* group.

Aceraius parvulus sp. n.

Mandibles with the basal upper margin simple, without any distinct tooth or prominence other than a slight convexity at the base. *Antennae* with club composed of three short and three moderately long lamellae. *Head.* Labrum with anterior margin straight; anterior angles of head not prominent; upper surface smooth and shining with hair-bearing punctures behind; outer tubercles long, asymmetrical, the left longer and broader than the right, obliquely truncate distad with the apex a little inclined upwards, the right simple and acute; inner tubercles situated near the base of the outer tubercles and on a level with their inner margin; a straight ridge joins the inner tubercles together; parietal ridges sharp and distinct at apex (type is immature); central tubercle small but distinct; frontal ridges very fine, not connecting with the inner tubercles (probably appearing obsolete in fully coloured examples); frontal area obsolete. *Pronotum* with indistinct and widely incomplete median groove, with hair-bearing punctures laterad. *Elytra* with all grooves finely punctured; ridges 7 and 9 with hair-bearing punctures throughout. *Mesosternum* wrinkled mesad with small linear scars. *Metasternum* with anterior intermediate areas, lateral areas, posterior intermediate areas and hind margins bearing piligerous punctures; disc impunctate. *Abdominal sterna* impunctate.

Length, 26 mm.

Locality: Malay Peninsula: Gunong Inas 3–4000 ft. *Skeat.* 30.xi.1899.

Type: Unique in Cambridge Zoological Museum.

With Gravely's table † of the genus *Aceraius* the present form runs down to *A. pilifer* (Perch.) of which I have examined Javanese specimens. *A. parvulus* is evidently very closely allied, but differs in its more slender form, in the absence of any strongly marked upper tooth on the left mandible, and in the different form of the left outer tubercle.

A. pilifer occurs only in Sumatra, Java and Borneo, and the present species probably replaces it in the Malay Peninsula.

Whether the two forms are subspecies of a single species can only be determined by the examination of further Malayan specimens.

* 1918, *Mem. Indian Mus.* **7**: 82–83.
† 1918, *Mem. Indian Mus.* **7**: 92–93.

Cetejus lateralis sp. n.

A large and rather flattened form for the genus with rather longer antennal lamellae than usual, thus presenting the appearance of a species of *Analaches*, from which it differs, however, in the absence of any distinct angular elevation on the basal upper margin of left mandible.

Shining black with a faint subopalescent sheen of variable extent which is quite distinct on the sides of the elytra.

Antennae with a club composed of three short and three moderately long lamellae. *Head.* Anterior margin of labrum straight; upper surface of head polished and smooth as a rule, sometimes somewhat rugose, impunctate or nearly so; outer tubercles asymmetrical, left broader than the right, truncate at apex and a little inclined inwards; right outer tubercle equal in length to the left but more slender and acute; parietal ridges and central tubercle as a rule not prominent; frontal area and ridges obsolete; inner tubercles prominent and joined by a ridge-like tumidity, about as widely separated from each other as are the outer tubercles; in front of the inner tubercles the frontal ridges are more or less obsolete. *Pronotum* impunctate throughout except sometimes for a few isolated punctures in the lateral grooves; median groove distinct, interrupted before and behind; underside of posterior angles moderately strongly hairy. *Elytra* with shoulders bare; all grooves distinctly though finely punctured. *Mentum* with the secondary scars forming a small semicircular groove; median part impunctate; side pieces with a mixture of large and small punctures. *Mesosternum* impunctate with small, lightly impressed scars. *Metasternum* with the anterior intermediate areas and lateral areas with large hair-bearing punctures; posterior intermediate areas with shallow hairless punctures; disc impunctate. *Abdomen* with impunctate scars; ultimate sternite impunctate and polished without apical groove.

Length, 33–35 mm.

Locality, etc. Type :—S.E. New Guinea : Rawlinson Mts. in Hincks and Dibb Collection. Paratypes :—2 examples British New Guinea : Owgarra. *A. S. Meek* (coll. Hincks and Dibb.), 2 examples New Guinea : Bolan Mts. (coll. Hincks and Dibb.), 1 example New Guinea : Finschhafen (coll. Hincks and Dibb.). A paratype will be deposited at the British Museum.

Variation occurs in the series examined in the degree of prominence of the small central tubercle and the parietal ridges, in the smoothness or otherwise of the head surface, in the size of the secondary mentum scars and the proportion of large to small punctures on the side pieces of the mentum. The frontal ridges in front of the inner tubercles vary somewhat in prominence. The Owgarra specimens have quite distinct punctures in the frontal groove.

I know of no species to which the present is closely allied. The genus *Cetejus*, however, is badly in need of revision, and for notes on this subject see my recent paper in 1937, *Nova Guinea* (n.s.) **1** : 113.

Labienus aberrans sp. n.

Antennae with club composed of three short and three moderately long lamellae. *Head* more or less symmetrical; outer tubercles simple, more or less conical and small, left a little longer than the right, apex of both slightly deflected upwards; anterior margin of head between outer tubercles slightly concave; central tubercle very small and inconspicuous; frontal area indistinct, very small; inner tubercles massive, placed close together and inclined upwards, being joined together transversely by a straight ridge; caudal portion of head behind inner tubercles smooth and impunctate; in front of inner tubercles frontal ridges obsolete and head rugose. *Pronotum* transverse, covered with

micropunctures distinctly visible with a × 15 lens; large punctures absent except a few in the scars; lateral and marginal grooves also almost impunctate; underside of posterior angles with moderately long hair; median furrow distinct and complete. *Elytra* apparently lightly fused; puncturation fine, a little stronger laterad than dorsad; sides with faint subopalescent sheen. *Mentum* with secondary scars close together and close to anterior margin, mesad finely punctate, coarsely laterad. *Mesosternum* impunctate with distinct subrugose scars. *Metasternum* with sides, anterior intermediate areas and lateral areas closely punctate and densely hairy; disc and posterior intermediate areas impunctate. *Abdomen* with subrugose scars; ultimate sternite with strong apical tuft of hairs.

Length, 31 mm.

Locality: North New Guinea.

Type: Unique in Zoological Museum, Buitenzorg.

A very distinct species, which, whilst conforming to all the characters of *Labienus*, has the appearance of a *Cetejus*. The massive obliquely elevated inner tubercles will readily distinguish this species from any of the members of its genus.

Gonatas intermedius sp. n.

Very similar to *G. germari* from which it differs in having the antennal lamellae distinctly shorter, the posterior margin of the mentum slightly curved, the scars forming a ω-shaped figure (in *G. germari* the scars are W-shaped). The lateral striae of the elytra are also rather more strongly punctured. Length, 27 mm.

Type: Admiralty Is.: Manus 1932 (*N. E. H. Caldwell*) in British Museum (Imperial Institute of Entomology).

In almost all other characters this species is identical with *G. germari*. The form of the mentum, however, places it in a different section from *G. germari* and its allies according to the arrangement adopted by Gravely (1918). This section, characterised by the ω-shaped mentum, contains *minimus* (Kuw.), *altidens* Heller,* *pumilio* (Kaup), *cetioides* Zang † and the present species.

Of these *minimus* and *altidens* have complete dentition, whilst the remainder have that of the left mandible reduced. *G. cetioides* is a more convex form, and *pumilio* is much smaller, so that neither can be confused with *intermedius*.

* 1910, *Abh. zool. Mus. Dresden*, **13** (3) : 15–16, t. 1, f. 13. [New Guinea: Toricelli Mts., alt. 900 m.] In the Hincks and Dibb Collection there are two examples from New Guinea: Bolan Mts., and I have seen a third specimen probably belonging to this species from Bougainville I.

† 1905, *Deuts. ent. Z.* **1905** : 316 [Patria?]. I have two examples also without locality. Gravely, 1918, *Mem. Indian Mus.* **7** : 108 records it from New Britain.

ON THE BRITISH LESTREMIINAE, WITH NOTES ON EXOTIC SPECIES.—I. (DIPTERA, CECIDOMYIIDAE)

By F. W. Edwards, F.R.E.S.

The subfamily Lestremiinae has hitherto remained one of the least-known groups of British Diptera, no doubt because the species are small and inconspicuous, while few or none of them are of any economic importance and (in contrast with the Cecidomyiinae) none of them is a gall-maker. I reviewed the British species of the *Lestremia* group in 1929 (*Ent. mon. Mag.*, **65** : 9–16), but the more numerous species of the *Campylomyza* group have not till now been studied in Britain; moreover, some errors in my paper of 1929 have become apparent, and additional data accumulated regarding the *Lestremia* group, so that a complete revision of the subfamily in Britain is desirable.

This study could not have been undertaken without a preliminary examination of such types of the European species as still exist. In the spring of this year (1937) I was able, through the kindness of Prof. E. Reichensperger, to examine and, where necessary, dissect the important series of types in the Winnertz collection in Bonn University. Monsieur E. Séguy allowed me to examine the material in the Meigen collection in Paris; Abt L. Czerny sent me some types from the Strobl collection in Admont, and Dr. G. Enderlein sent for study the specimens named by Kieffer in the Rübsaamen collection in the Berlin Zoological Museum; these last were unfortunately few in number. I am therefore now in a position to redefine most of the species described by the older authors, but it appears that for most of Kieffer's species no types exist. I took the opportunity afforded by a visit to western Germany in May 1937 to visit Bitche, Kieffer's home town, where I discussed the point with the Abbé Fourer, head of the College, and Monsieur V. Schmitt, Kieffer's successor as professor of natural science. They could only confirm what I had already understood to be the case, namely, that Kieffer not only did not make types, but was not even interested in forming a collection: in the case of material collected by himself he usually destroyed the specimens after describing them; specimens sent him by others were returned to the senders. There are at any rate no named Cecidomyiidae among the materials left by Kieffer, and the most that can be hoped for is that an examination of his papers, which is to be undertaken by Monsieur Nominé, may reveal unpublished notes and drawings.

The British material examined consists largely of adult specimens captured by myself, chiefly during the last two years, either on windows or in woods and about old logs. In addition to my own captures, the fairly extensive collections of the late Mr. F. Jenkinson in the Cambridge Museum, and of Messrs. K. Britten and A. H. Hamm, have been placed at my disposal, and I have also been able to examine the Lestremiinae in the collection of Dr. H. F. Barnes. As a result the total number of British species of the subfamily now known to me is over 50 (as against 19 noted in a manuscript list of British Cecidomyiidae compiled by Dr. H. F. Barnes in 1935), and it is certain that this number will be considerably augmented in the future.

Technique.

My specimens have either been collected in alcohol, or pinned in the field when freshly killed; slide mounts are usually necessary for determination, but it is very desirable whenever possible to preserve some specimens dry, as various features of colour, pubescence, etc., are inevitably lost in mounting, and, moreover, the fainter veins of the wing are easily seen in the dry specimen, whereas they may become almost invisible in a mounted wing unless it has been well stained. I find that much the easiest and best mountant to use is De Faure's chloral-hydrate gum (Flatters and Garnett); specimens can be transferred directly from spirit to this gum. It is perhaps best to place the slide in a warm oven for a few hours immediately after mounting, but this is not essential; nor is it necessary to ring the coverslip with cement, as the gum will set within a few weeks even without warming. Care should be taken to use only a sufficient amount of gum to allow for the considerable shrinkage which takes place: it is also desirable, while the specimen is still in spirit, to remove one or both wings, the tip of the abdomen, and perhaps the head, and mount these parts under separate small coverslips; wings must be mounted as flat as possible, but, in mounting genitalia, pressure should be avoided. Specimens which have been pinned can be mounted in the gum almost as readily as those which have been collected in alcohol, and with almost equally good results: it is only necessary first to soften them by placing them for a few minutes in a mixture of caustic potash and spirit (cold) and then wash them in plain spirit (not water).

As noted above, it is sometimes necessary to stain wings in order to show up the fainter veins. For this purpose the wings should be removed from the specimen and placed in a solution of carbol-fuchsin in glacial acetic acid; after being left in this stain for 24–48 hours they may be transferred directly to clove oil and mounted in balsam. Stained balsam preparations of the head and male genitalia can be prepared in a similar way, except that the specimen must first be cleared in caustic potash which is just brought to boiling point; such specimens do not take nearly so long to stain as do the wings (an hour or less will suffice). The structure of the eyes is much more readily seen in a cleared balsam mount than in a gum mount, as the gum does not clear the pigment.

For examination and dissection I use a binocular microscope with 32 mm. objective and No. 4 or No. 5 eyepiece, giving a magnification of about 100. All but the smaller species of Lestremiinae can be identified with the aid of this instrument, but of course a monocular microscope with $\frac{1}{6}''$ objective is necessary to study the finer details of antennal or genitalic structure.

Structure.

The following remarks on structural characters of the Lestremiinae are merely intended to call attention to certain features which have not been fully described by previous writers, and to explain some of the terms used in this series of papers.

Head.

Kieffer and others have given as a character of Lestremiinae, distinguishing this subfamily from others of Cecidomyiidae, the presence of three ocelli. I now find that this diagnosis is not quite correct, as the genera *Lestremia*, *Gongromastix* and *Anarete* have only two small ocelli, and in some exotic

species of the last-named genus ocelli are absent. All other genera of the subfamily, as far as I have observed, possess three well-developed ocelli.

The shape of the eyes gives valuable generic indications in several cases, the dorsal extension of each eye (" eye-bridge " of Enderlein, 1911) being narrow in some genera, broad in others, while in *Campylomyza* the dorsal part of each eye is separated from the main portion and united with its fellow, thus producing a " three-eyed " condition.

The sensory structures on the antennae have been much used by Kieffer and Felt for generic distinctions, but as these are largely sexual and their form is so varied they appear to be of more use for specific than for generic differentiation. It is noteworthy that in this subfamily antennal sensoria are much better developed in the females than in the males, the converse being the case in the CECIDOMYIINAE. The general form of the sensoria is constant for any given species and often for a group of related species, but shows some variation according to the part of the antenna on which the structures occur. For the figures of single antennal segments drawn to illustrate the sensory structures of the British species, I have selected a segment near the middle of the antenna. In these figures, for simplification of drawing, only the sensory structures have been shown and the ordinary hairs indicated by their sockets, the size of which is a rough indication of the length of the hair. A useful character for distinguishing some species is the number of hairs comprising the main hair-whorl.

In many groups of CECIDOMYIIDAE the number of palpal segments has been regarded as a feature of generic importance, but this is not often the case in the present subfamily, where in various genera obviously closely-related species, or even in some cases individuals of the same species, may have either three or four palpal segments. Where the number of palpal segments is fewer than three the species concerned have been treated as generically distinct from the others, but it appears questionable whether any genera in this subfamily should be separated on such grounds alone. The vestiture of the palpi is sometimes of importance; it may consist only of hairs or may include many small scales.

Thorax.

In all genera of the subfamily except *Campylomyza* and its relatives, the vestiture of the mesonotum is confined to the sides and to a pair of dorsal stripes convergent behind, bearing the dorso-central hairs; in the genera of the *Campylomyza* group, however, the mesonotum has a more or less uniform covering of short hairs, which may be sparse or dense. The pleura is always bare.

Legs.

Kieffer made considerable use of the form of the claws, particularly the presence or absence of minute serrations or lateral striations, or subapical thickenings of the claws, in diagnosing the genera of this subfamily. I have not used these features for generic diagnosis because I find the characters difficult to appreciate, and it would seem that the apparent differences may in some cases be due merely to differences of orientation. On the other hand, the form of the empodium, as pointed out by Kieffer, is undoubtedly of much taxonomic value. I find also that the vestiture of the legs is of importance. In *Lestremia* the short pubescence of the tarsi consists of flattened hairs or very narrow scales which are all of similar length and all straight; in the

Campylomyza group the tarsal vestiture is of two lengths, the longer consisting of simple hairs, the shorter of simple hairs in some genera and of distinct, blunt-tipped scales in others.

Wings.

The venation of the wings provides characters of great importance for classification. In addition to more obvious features, such as the condition of the media and cubitus, which have been used for generic definition, I find that (especially in Campylomyzini) many minor features, such as the relative lengths of *R*1 and of the base of *Rs* (the apparent cross-vein), the degree of obliquity of the latter, the angle subtended by the cubital fork, and the length of *Cu*2, are valuable for specific and even generic differentiation.

The Comstock–Needham system of notation is used here, and needs no explanation beyond the lettering on fig. 1, a and f; for convenience and brevity I use the symbol *Rs* to indicate only the short basal portion of the radial sector, and *R*5 for the main portion beyond the junction with *r–m*. The vein *CuP* (posterior cubitus of Tillyard, 1936), a short concave vein lying immediately beneath the basal part of *Cu*, has not been referred to by previous writers on this family; it is only of interest because it provides one of the tribal features of Campylomyzini and Strobliellini, where it is fused distally with *Cu* instead of ending free as usual.

On certain of the main veins of the wing are to be found minute *pores*, the presence of which on wing-veins of CECIDOMYIIDAE was first noted by Collin in 1914 in certain African species. These pores are not always easy to see but can usually be detected in a gum or balsam mount by careful examination under the high power of the binocular, or in any case with the $\frac{1}{6}''$ objective; they must not be confused with the sockets of hairs. I find that the positions of these pores sometimes provide useful indications of affinity in the Campylomyzini; in that tribe there are always three towards the tip of *R*1, and two or three, which vary in position, on *R*5 and *rm*; in the Lestremiini (fig. 1, f) the arrangement is quite different.

The hairs on the wing-membrane and veins are of two kinds, as in most Nematocera: very small *microtrichia* evenly distributed over the whole wing and larger and less numerous *macrotrichia* which differ from microtrichia in being easily broken off and provided with distinct sockets (which can be seen even when the hairs themselves are lost). The distribution and density of the macrotrichia often provide good generic and specific characters.

Genitalia.

I have paid particular attention to the male genitalia and to the female spermathecae, which have not hitherto been studied in detail in this group of flies, though providing excellent diagnostic characters for the separation of species and genera. The characteristic type of each genus is fully described in the sequel, but a general explanatory account of the male genitalia of CECIDOMYIIDAE is perhaps desirable here as the structures have never been described fully by other students of the group. As in all other Nematocerous Diptera the male hypopygium ("genitalia") consists of four parts: (1) ninth abdominal segment; (2) appendages of ninth segment—forceps or claspers; (3) tenth segment—anal segment or proctiger; and (4) sclerotisations connected with genital opening—true genitalia or aedeagus. These parts are shown with explanatory lettering in fig. 1, l–t.

(1) *Ninth segment.*—The tergite (9*t*) is variously developed in different

genera, its condition providing generic characters of importance in many cases. There is no separate ninth sternite in LESTREMIINAE or indeed in any CECIDOMYIIDAE.

(2) *Forceps.*—Each arm of the forceps consists of a large basal segment or *coxite* (*cx*) and a smaller distal segment or *style* (*st*). The two coxites are united midventrally at their bases to a variable extent; in some cases (as in *Campylomyza*) this union of the coxites is almost complete; the two being separated merely by a small emargination, and in this condition I have called the whole structure the *sternocoxite*. In the absence of a separate sternite and the fusion or at least the incomplete separation of the coxites, the CECIDOMYIIDAE resemble the BIBIONIDAE, MYCETOPHILIDAE and BLEPHAROCERIDAE, and differ from other families of Nematocera such as TIPULIDAE and CULICIDAE; this is one of the many features indicating that the relationships of the CECIDOMYIIDAE are with the MYCETOPHILIDAE and BIBIONIDAE. In many CECIDOMYIIDAE where the coxites are largely separate they may show more or less conspicuous basal lobes, but I have not observed such lobes in LESTREMIINAE; on the other hand, the tip of each coxite may be produced into a lobe. The style is of various shapes and may or may not have a terminal articulated spine. Each coxite has a sclerotised *root* (*rc*) which passes inwards beneath the anal segment and is connected with the base of the tenth sternite and with the base of the dorsal wall of the aedeagus; these roots provide taxonomic characters of considerable importance; they may end freely, or (as in Campylomyzini) they may unite with one another to form a more or less semicircular loop, the median portion of which may be widened.

(3) *Anal segment.* This comprises a *tergite* (10*t*) to which are attached a pair of *cerci* (these structures together forming the dorsal plate of Kieffer), and a *sternite* (10*s*) (ventral plate of Kieffer) which may be a single piece or may be divided into a pair of narrow sclerotised strips; in either case the sternite is covered with fine pubescence except towards its base; as just noted it is connected at the base with the roots of the coxites. The anal segment in CECIDOMYIIDAE is separated from the ninth tergite by a rather wider area of membrane than is usual in Nematocera (consequently the ninth tergite has not always been recognised as a distinct structure forming part of the hypopygium in this family). In its primitive condition (as in the SCIARINAE, the genera *Lestremia* and *Anarete*, and most of the subfamily CECIDOMYIINAE) the anal segment is fairly large and conspicuous, but in the Catochini and Campylomyzini and the genus *Gongromastix* it is small and hidden beneath the ninth tergite.

(4) *Aedeagus.* In the CECIDOMYIIDAE the aedeagus usually takes the form of a simple sclerotised tube (more or less incomplete ventrally) which surrounds the distal part of the male genital duct; this was termed by Kieffer the "stylet," and corresponds to the part which in various recent papers I have called the *tegmen* or penis-sheath. In the LESTREMIINAE two distinct parts of the aedeagus may usually be recognised: a dorsal plate or *tegmen* (*t*) lying immediately beneath the tenth sternite, and a rod-like structure, the *genital rod* (*gr*) lying more or less free beneath the tegmen (but inside the ventral body-wall). So far as I have been able to make out, this rod does not contain a duct but is solid and probably represents the apodeme of the vesica, the vesica itself in this subfamily (in contrast with the TIPULIDAE, SCATOPSIDAE, etc.) not being distinguishable as such. The clue to the homology of the genital rod is apparently to be found in the genus *Campylomyza*, where in gum mounts a pair of pale tubes can often be seen lying one on each side of

the rod and attached to its capitate tip; if I am not mistaken these two tubes are the efferent ducts from the testes. At the tip of the genital rod, that is, at the actual genital opening, there are often specialised minute teeth or other structures. The rod itself is sometimes absent. In *Campylomyza* paired sclerotised structures arise from the base of the tegmen and perhaps correspond with the *parameres* of other Nematocera, though they are not definitely articulated as true parameres should be.

In the female the most important abdominal structures for taxonomic purposes are the spermathecae; it is remarkable that these structures do not appear to have been mentioned by any previous worker on this family of flies, one reason for this perhaps being that they can only be seen distinctly in well-cleared mounted specimens. I find that sclerotised spermathecae are absent in *Lestremia* and *Anarete*, but present (though very variable in form) in other genera of LESTREMIINAE. Dr. H. F. Barnes informs me that they are absent in the CECIDOMYIINAE, and this fact, together with some others (such as the well-developed anal segment of the male, and the tendency to reduction of the ocelli of *Lestremia*), shows that *Lestremia* may be nearer to the CECIDOMYIINAE than is *Campylomyza*.

CLASSIFICATION.

As the LESTREMIINAE as a whole were grouped by Enderlein (1911) with the SCIARINAE and SCATOPSIDAE, and as the genus *Anarete* has sometimes been placed in the SCATOPSIDAE, while two apparently Scatopsid genera have been included by Felt in the LESTREMIINAE and a species of *Lestremia* has been described by Malloch in the Sciarine genus *Zygoneura*, it may be as well to call attention to the more obvious distinctions between the three groups, which are as follows :—

LESTREMIINAE : Antennae with verticils (even if short). Eyes always bare. Thorax usually with distinct dorso-central rows of hairs. Abdomen of ♂ with eighth segment well developed; hypopygium of simple type, no vesica. Tibiae slender, without spurs. Wings with *Cu*1 never quite reaching base of wing.

SCATOPSIDAE : Antennae without verticils. Eyes always hairy. Thorax with pubescence only, no distinguishable dorso-central hairs. Abdomen of ♂ with eighth segment atrophied, hypopygium complex, with large vesica. Tibiae distinctly widened from base to tip, without spurs. Wings (at least in subfamily SCATOPSINAE) with *Cu*1 quite separate from *Cu*2 and reaching base.

SCIARINAE : Antennae without verticils (though the pubescence may be lengthened). Eyes usually hairy. Thorax always with distinct dorso-central hairs. Abdomen of ♂ of primitive type as in LESTREMIINAE, no vesica. Tibiae slender, spurred. Wings with *Cu*1 rising from *Cu*2 near base of wing.

Kieffer and Felt divided the LESTREMIINAE into three tribes, according to the condition of the median and cubital veins : Lestremiariae with forked media; Strobliellariae with simple media and cubitus forked near base; and Campylomyzariae, with simple media and cubitus forked near middle. I would also recognise these tribes, but differ from Kieffer in removing *Catocha* (together with *Catarete*) from the company of *Lestremia* and forming another tribe for it. The main characters of the three tribes as I would define them are indicated in the following key :

1. Ocelli two (often very small and occasionally absent); scutellum small; female without sclerotised spermathecae; wings with *Rs* short, more or less obliterated; *R*5 running close to costa and ending far before wing-tip; costa ending abruptly at tip of *R*5; *M* with long fork, longer than its stem, one or both branches thick; *An* present (though incomplete); humeral cross-vein present; *CuP* free . . . . . Lestremiini.
   Ocelli three; scutellum large; female with sclerotised spermathecae; wings with *Rs* always distinct, transverse or oblique; *R*5 far removed from costa and nearly or quite reaching wing-tip; costa usually extending well beyond tip of *R*5; *M* thin throughout and with short fork or none; *An* and humeral cross-vein absent . . . . . 2.
2. *Cu*1 free; *CuP* free (but short and indistinct); *M* with or without short fork . . . . . Catochini.
   *Cu*1 arising from *Cu* near middle of wing; *CuP* fused with *Cu* (only traceable as a distinct vein close to base of wing, thence forming part of the thick stem of the fork); *M* always simple (often faint) . . Campylomyzini.
   *Cu*1 free; *CuP* fused with *Cu* as in Campylomyzini; *M* simple . Strobliellini.

In compiling the above key I have taken no account of *Tritozyga* Lw. and *Konisomyia* Felt, which are included by Felt in the Lestremiariae; I do not know either of these genera but strongly suspect that they both belong to the family Scatopsidae. I have also excluded from consideration *Catocha americana* Felt and *C. barberi* Felt, which certainly do not belong to the genus *Catocha* and probably not to the tribe Catochini.

Lestremiini.

The genera and species of this group are everywhere few in number. I recognise only two genera as occurring in Britain, both of which seem to be more or less cosmopolitan in distribution. So far as I am aware only one other described recent genus (*Gongromastix* Enderlein, 1936) is correctly referable here; a re-description of it follows the account of the genus *Anarete* in this paper. Little or nothing is known about the life-histories of species of this tribe; they are believed to be largely xylophagous or saprophagous, and probably some of them have been widely distributed by commerce though this has not been established. Dr. H. F. Barnes has recently obtained adults of *L. cinerea* from larvae feeding in the stalks of mushrooms.

The ocelli of *Lestremia* have sometimes been said to be absent, those of *Anarete* three in number; Kieffer indicates three for both genera. Actually, as stated above, there are two small ocelli in all species of the tribe that I have examined, except in an African species of *Anarete*, in which ocelli appear to be absent.

In both *Lestremia* and *Anarete* the pores on the wing-veins have the same arrangement: there are two near the *base* of *R*1, one at the point where *rm* meets *Rs*, one a little way along *R*5, and three more near the tip of *R*5 (two on the upper surface and one on the lower) (figs. 1 f and 2 g). This arrangement is quite different from that of the Campylomyzini.